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PLATE VIII.

- Fig. 1. (12109) *Tipula tartari*, ♀, $\frac{3}{4}$.
 " 2. (11806) *Tipula heilprini*, ♀, $\frac{3}{4}$.
 " 3. (9157) *Tipula subterjacens*, ♀, $\frac{3}{4}$.
 " 4. (2839) *Tipula limi*, ♀, $\frac{3}{4}$.
 " 5. (13737) *Tipula subterjacens*, ♂, $\frac{3}{4}$.

PLATE IX.

- Fig. 1. (1611) *Tipula limi*, ♂, $\frac{3}{4}$.
 " 2. (402) *Tipula lethæa*, ♀, $\frac{3}{4}$.
 " 3. (8831) *Tipula lapillescens*, ♂, $\frac{3}{4}$.
 " 4. (8598) *Tipulidea picta*, ♀, $\frac{3}{4}$.
 " 5. (8480) *Tipulidea reliquiae*, ♀, $\frac{3}{4}$.
 " 6. (13745) *Tipulidea picta*, ♂, $\frac{3}{4}$.
 " 7. (9039) *Micrapsis paludis*, ♂, $\frac{3}{4}$.
 " 8. (11333) *Tipulidea bilineata*, ♀, $\frac{3}{4}$.

*Some of the Work of the Wagner Free Institute of Science of
Philadelphia. By Joseph Willcox.*

As the representative of the Wagner Free Institute of Science invited to participate in the celebration of the 150th anniversary of the American Philosophical Society, I have thought it proper to make a few statements concerning some of the work of the Wagner Institute, a colaborer with this Society in the same field of usefulness.

Though young in age, the Wagner Institute has endeavored to profit by the experience of older institutions. It was established by the late Prof. William Wagner who, in the year 1847, gave a course of free lectures on scientific subjects at his house. The success of this experiment encouraged him to found an institution for instruction in science, to include a museum of natural history specimens, a laboratory for physical and chemical students, a library and a lecture department.

The building of the Wagner Free Institute of Science was completed in 1864, and from that time until Prof. Wagner's death in 1885 courses of free lectures were maintained on scientific subjects during each succeeding winter.

Prof. Wagner spent a large portion of his life in accumulating and husbanding resources for the future use of the Institute.

Among other favorite pursuits, he collected minerals in northern New York and Nova Scotia, and fossils in Maryland and Virginia, at a time when those localities were difficult of access.

After the death of Prof. Wagner in 1885, the Trustees proceeded, as rapidly as the funds at their command permitted, to open the museum and library for the use of the public. The library was opened for use in 1889, and the museum in 1891. The lectures have also been maintained since the death of Prof. Wagner. These schemes are, of course, a source of benefit only to the people living in the vicinity of the Institution. In order to enlarge the domain of its usefulness, the Trustees determined to promote the work of original investigation both in the laboratory and in the field, and to publish the results in the form of its *Transactions*. It was concluded to take up either a new or a long neglected subject for the pursuit, rather than to direct the energies of the Institute into a field already occupied by competent explorers.

Since the time when Messrs. Lea, Conrad, Say, Morton, Emmons, Rogers, Tuomey and Holmes maintained great activity in the study of our Tertiary formations, the subject has practically been permitted to lie dormant, especially in relation to the middle and the later beds, until the year 1886. During that year the attention of the Trustees of the Wagner Free Institute having been directed to the State of Florida as affording a new and inviting field for investigation, a small party was organized and spent a few weeks there under the auspices of the Institute. The most important of the results was the discovery of a Pliocene shell bed, rich both in numbers and species; the first undoubted deposit of that age that has been discovered in the eastern portion of the United States. The material collected in the bed was productive of many new forms.

The results of the first exploration prepared by Prof. Heilprin were published by the Wagner Institute, and formed the first volume of its *Transactions*. During the following winter further explorations were made in Florida, and, among other fossils, many vertebrate remains were collected, including several new species. The descriptions of these were written by the late Prof. Joseph Leidy, and were published in the second volume of the *Transactions* of the Institute.

These explorations were subsequently prosecuted in Florida by several friends of the Institute, including Prof. William H. Dall, of

the U. S. Geological Survey ; each year affording a more extensive knowledge of the geology of that State, which has been found to include all the Tertiary formations. Prof. Dall has since been engaged in examining and writing upon these additional collections. Two volumes of his papers have already been published by the Wagner Institute, containing twenty-two plates of illustrations ; and another, by the same author, is in the course of preparation.

Until recently, the question of the existence of Tertiary beds of Pliocene age in North and South Carolina had never been determined, as geologists held different opinions, based upon the fossils that had been collected in those States in a desultory, unsystematic manner. In order to solve this question, the Wagner Institute authorized the Curator of its museum to explore the fossil beds in the eastern portion of those States in November, 1891. After four weeks' work in the field, the question was satisfactorily determined that Pliocene beds exist in each of those States. This matter was fully discussed by Prof. Dall in Vol. iii, Part ii of the *Transactions of the Wagner Institute*.

The U. S. Geological Survey has generously coöperated with the Wagner Institute in this work, not only in the researches in the field, but in permitting one of its specialists, Prof. William H. Dall, to investigate the collections and to edit the volumes of the *Transactions* in which they are described. A new interest has been awakened in the study of our American Tertiary invertebrate palæontology by the publications referred to.

In order to further stimulate the study of that department of geology, the Wagner Free Institute of Science proposes, at an early date, to reprint T. A. Conrad's book, the *Medial Tertiary Fossils of the United States*, the most important work pertaining to our Miocene formation. This book was published in the year 1838. It has been out of print for many years ; a very limited number of copies only having been printed.

A large portion of the specimens collected during these explorations are now arranged in the Free Museum of the Institute for the use of students. These explorations have been supplemented by others, in the Miocene beds of Maryland, Virginia and North Carolina, in order to supply additional subject-matter for the publications and to enrich the museum.